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DATA PROCESSING DIGEST

1140 South Robertson Blvd., Los Angeles 35, California

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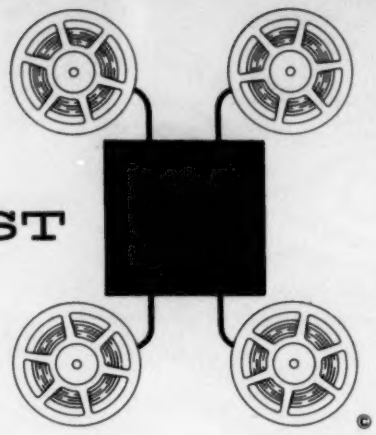

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Management Sciences

THE HUMAN FACTOR IN BUSINESS GAMES

Paul S. Greenlaw, Pennsylvania State University; and Stanford S. Kight, Drexel Institute of Technology
BUSINESS HORIZONS, Fall 1960; pages 55-61

Management games offer possibilities for a learning situation in the dynamics of decision-making groups and the interpersonal skills needed in effective decision-making. The players contend with a "complex network of interpersonal forces...[which]have a bearing upon the productivity of the group and, consequently, upon the effectiveness of action taken." Management decisions "are rarely, if ever, conditioned solely by purely logical thinking and analysis.... In reality, they are strongly influenced by the needs, attitudes, feelings, and emotions of those who participate in their making."

Some users of games have tried to focus attention of the participants upon the human data generated during the play, during the discussion period. Others have had an observer sit with each group who, at various times during the play or afterwards, feeds back information to the group about its behavior as a basis for discussion and analysis. "Almost invariably, emphasis is upon patterns of group development rather than the individual's behavior patterns, roles taken, or techniques of relating to other members of the group. [However, an ever present danger is that discussion too personal in nature or touching upon an individual's deep-rooted personality problems may produce a traumatic reaction.]"

"For the individual to discard some of his present behavior, beliefs, and values in favor of others that may be more adequate, certain conditions must be present. First, the learner must feel free to reveal to the group his present attitudes, feelings, and beliefs, for as long as an attitude is private, it is difficult to test for adequacy. Second, it is important that the individual receive information that will enable him to perceive more accurately and/or overcome inadequacies in his present beliefs and behavior....[But] the feedback must be given in a low-threat situation if it is to produce an increased understanding of his relationship with others. Third,

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it is important that the learner, once he has become aware of his inadequate interpersonal responses and of possibly more appropriate ones, have an opportunity to test his new behavior for how well it satisfies his needs."

What, then, is the learning potential of the group? "In general, management games seem to generate a greater degree of ego involvement among participants than most other group training approaches.... However, it may be that too much involvement takes place in management games, and that, consequently, the individual cannot lower his defenses sufficiently to accept feedback from others in the group on the adequacy of his behavior, beliefs, feelings, or attitudes."

The group situation may "threaten" the player

Several possible approaches that may minimize this danger are:

1. Provide the participants with an opportunity to engage in one or more practice rounds of play before beginning the main portion. This lowers the initial threat from exposure of inadequacies and enhances the group cohesiveness.

2. Allotting more time for making decisions may lessen the pressures and tensions, providing a less threatening learning situation.

3. More adequate preparation of simulation play through lectures and discussions of the more theoretical aspects of human relations, and participation in group role-playing situations, may help create a climate for discussion of group behavior. In this situation, the groups should be organized as they would be in the game.

Management games seem to provide an excellent medium for focusing attention upon the dynamic interaction between people and "things." However, there may be a danger in attempting to accomplish too much at one time. "If the objective of the simulation exercise is to focus attention upon the analysis of business data, perhaps little emphasis should be placed upon the interpersonal relationships and group forces in the decision-making process. If, on the other hand, a balanced emphasis of these two objectives is desired, some of the preparation approaches suggested previously should probably be given special attention to the training program." The game situation provides an excellent opportunity for the simulated experiencing of the problems of other groups.

Is the purpose learning about business or about oneself?

The critique session is not especially conducive to significant analysis of human relations data because the groups are inclined to defend their own group's positions against the others and gloss over any conflicts that may have existed among the membership. Rather, continuous feedback should be provided the group during the play periods by the observer, with sufficient time between periods for discussion and analysis of human data.

General Information

ARE YOU READY FOR ELECTRONIC DATA PROCESSING?—SOME OBSERVATIONS ON THE FEASIBILITY STUDY IN A MEDIUM-SIZED COMPANY

James W. Sweeney, Tulane University, New Orleans, Louisiana
N.A.A. BULLETIN, September 1960; pages 22-30

Many feasibility studies are being made which compare the cost of the EDP system against the presently used punched card system, without regard for the difference in experience between the two. In these cases, the feasibility study will be ultra conservative, and may not show up the favorable aspects of the electronic system. To gain a worthwhile picture of the advantages of the new system, management should do systems research as part of the feasibility study, and not rely on the existing system as the technical criterion.

One danger to the medium-size company is that there is a point of no return in the cost of conducting a study, beyond which reversal may be prohibitively costly. There are three approaches which the medium-size company may take in the feasibility study: 1) appoint a full-time employee to be responsible for the project and report to a small committee of top management; 2) hire an independent consultant to work with the personnel in the organization; and 3) invite several manufacturers to make the studies. The latter method has an inherent danger, in that the study usually turns out to be a proposal.

The accounting personnel should beware of appropriating the computer for their own use and relegating other departments to left-over time. A more integrated usage will be of greater value to the whole company.

INFORMATION PROCESSING

Published by UNESCO, 1960. $25

The Proceedings of the International Conference on Information Processing held in Paris in June 1959 are now available. The papers cover the following topics: Methods of digital computing, common symbolic language for computers, automatic translation of languages, pattern recognition and machine learning, logical design of computers, computer techniques of the future, error detection and correction, and collection, storage, and retrieval of information. For information, write to: International Documents Service, Columbia University Press, New York 27, New York.

AUTOMATIC DATA PROCESSING: ROLE IN LOGISTICS PROGRAM

Maj. Gen. L. P. Dahl, AMC, Wright-Patterson AFB, Ohio
THE ARMED FORCES COMPTROLLER, September 1960; pages 33-36

Four major problems encountered in the AMC logistic support program are:

1. The deliberate use of competing manufacturer's equipment to stimulate development of superior equipment causes some training and administration costs and makes the management task more complex. It is suggested that an Air Force Comptroller committee be established to study the need for some standardization of equipment.

2. There is an accompanying lack of standardization in data terminology and recording which needs to be remedied.

3. More attention should be given to the problems of data input, with special emphasis on control and design of equipment.

4. Programing costs could be reduced through the establishment of common language automatic coding techniques.

Some decisions which face AMC are these: Whether to settle for some hardcore systems and move only with big technological changes, or continue to move into more sophisticated ADPE as it comes from the manufacturers; whether the Air Force management is ready to centralize and standardize the ADP system; whether Comptrollers should retain control of responsibility for ADP, or allow freer access to total systems design by others in the organization; whether the cost of ADP should be increased at the expense of other budgetary items; and whether management will be able to adequately control the ADP system.

THE ABC'S OF MICR

BANKING
September 1960; pages 221-226

Some of the requirements of MICR which must be met by the printers and lithographers are listed. These include:

Critical measurements of placing the magnetic ink characters at the bottom of the check, spacing the characters within the allowed tolerance, and avoiding "skew" by more than 1-1/2 degrees.

Embossment, which is the impression of a printing press plate below an allowable amount.

"Signal level" of the character, which requires a sufficient coverage of ink and iron oxide content to send the proper electronic impulses to the reading head.

Standards demanded of the check printers

Uniform distribution of ink within the outlines of each character.

Lack of extraneous ink on other parts of the check, including the back where ink may be offset from the check printed immediately beforehand.

Cutting of paper in sufficiently small amounts that measurements may be maintained within allowable tolerance. (Some printers are perforating checks singly in order to maintain the tolerances.)

Uniformity of paper thickness and level-ness of paper surface. (Humidity affects these characteristics so that some printers are air conditioning their plants to control temperature and humidity.)

Drying qualities of magnetic ink must be such that ink will not offset on succeeding check as it comes from the press.

One printer has employed 10 persons to do nothing but make evaulations of the printed checks. Even so, they can only spotcheck, since an inspection for one check takes nine minutes. While the printing specifications required by the A. B. A. appear to be higher than necessary for accurate reading, it is realized that many checks will not return to a bank in good condition, and this lower quality must be considered in the original testing requirements.

BANK AUTOMATION—IN LAYMAN'S LANGUAGE

BANKING, September 1960; pages 206, 209-216

This is exactly what the title says it is, an explanation of bank automation in the simplest and most general terms, for an introductory lesson in EDP banking procedures.

REAL TIME—NEXT STEP IN DATA PROCESSING

Jay W. Schnackel, Remington Rand Univac
JOURNAL OF MACHINE ACCOUNTING, September 1960; pages 12, 13

The next dominant document in electronic data processing will probably have the following characteristics:

1. It will use real language, not code.

2. It will not need elaborate machinery for the recording of data.

3. It will be man-readable.

4. It will contain many hundreds or thousands of digits, and will be different in size, shape and stock from the punched card.

5. It will be used for real-time operation--near-instantaneous remote entry of data, inquiries, and receipt of replies.

A TRAINING COURSE IN DATA PROCESSING

Van B. Thompson, Training Consultant
DATA PROCESSING (US), September 1960; pages 19-23

An outline of a training course is presented, designed for individuals who have had no prior knowledge of punched card or computer equipment and methods. The course is built around a specific set of machines including certain IBM punched card equipment, and the IBM 650. It is useful for company-training programs for individuals who will be engaged in operating or planning an EDP system, or for "management personnel seeking a working knowledge of the field as a means to better communications and improved management skills."

Instructions for setting up the program, selecting trainees and instructors, and a complete course outline, including a bibliography and suggested tests, are given.

This course begins with punch card operations and progresses through accounting machines, computers, and elementary programing.

CORRECTION

The paper by Burton Grad titled "A Systems Approach to Integrated Systems Planning," which was abstracted in Data Processing Digest, July 1960, page 11, is available from the American Institute of Electrical Engineers, not the AIIE, as stated. For a copy of the complete paper, write to: AIEE, 33 West 39th Street, New York 18, New York. Ask for Conference Paper #60-331.

Programing

MEASURING PROGRAMMERS EFFECTIVENESS

G. Edward Bissel, RCAF, Ottawa, Ontario, Canada
DATA PROCESSING (US), August 1960; pages 15-19

Allocation of work effort, evaluation of programer performance, scheduling, and prediction of work requirements are necessary for good supervision. All of these depend upon the establishment of performance standards, based upon measurement of programing functions and tasks. The following is a guide for task measurement:

Forecasting work loads and efficiency

Function	Unit of Measurement
Logic Development	
Develop English narrative	diagram blocks
English logic review	hours
Develop file content	fields
Programing	
Develop machine logic	blocks
Code instructions	instructions
Prepare file format layouts	files
Manuals preparation	hours
Programing assistance	hours
Instructional assistance	hours
Prepare output formats	hours
Debugging	
Pre-assembly preparation	hours
Desk checking	hours
Prepare test data cards	cards
Prepare program control cards	cards
Program debugging	hours

Each function must be analyzed for allowable work time. "Having secured a good sampling of work effort consumed, then an average time per unit of measurement may be established by dividing the total time consumed by the volume of units of measurement counted.... A budget forecast of work effort required by program is created for as many months ahead as is desired.... The creating of such a budget requires an intimate detailed knowledge of the application by the systems analyst."

When the total manpower requirements have been figured, they are "modified by a factor which reflects the degree of complexity of each program. Such a complexity factor may be established by determining the characteristics of a program and weighing each characteristic according to the analyst's conception of its impact upon the complexity of the program." Such a process has been out-

lined in the STEPS routine developed at System Development Corporation in Santa Monica, California.

During the programing procedure, each programer must keep an accurate account of his time and the volume of units of measurement on his job. A recapitulation of time sheets each month is compared with the prediction. Resulting statistics are then compared against the individual job standards to find the percentage efficiency of each programer, and the entire staff of programers. A comparison of the actual work against the prediction will give management a yardstick for evaluating the supervisor's ability to determine workload requirements.

IS TIME-SHARING A REAL WINNER FOR USERS?

R. Murray Paine, International Computers and Tabulators, Ltd.
AUTOMATIC DATA PROCESSING, September 1960; pages 16-18, 41-43

Parallel programing by hesitation and interrupt

For all practical purposes "time-sharing" means parallel programing. This may be accomplished by the hesitation mode and the priority interrupt. In the hesitation mode, buffers are done away with as much as possible, and the fast store is used for the input/output operations without stopping the computer performing other operations. "When the first unit of information... has been assembled from the tape control, and is ready to be transferred into the core store, the current program is caused to hesitate or pause. The data from the tape are then transferred to the core store, and the current program is then free to continue from the point it had previously reached, while the next unit of information is assembled from tape.... This method of time-sharing may mean that a single job is not performed any quicker but that it is performed with less equipment and probably at lower cost."

Another aspect of this mode is the variable block length facility. However, "the variable block length facility is not quite so elastic as it might seem, because in practice one has to set aside certain area of the store for input and output, though the size of these areas could vary from job to job."

In the "priority interrupt" technique, a system of priorities is essential so that the control unit knows which jobs to go to next. "The order of priority may be determined by the importance of the program to the user or by the fact that the program uses some piece of equipment which must not be kept waiting...."

Two factors which may work against the time-sharing idea are the actual lack of time for sharing due to an excessive number of input/output hesitations, and the cost of the many peripheral units required. "The right blend of applications would probably be a commercial one and scientific one; the former requiring much input/output operations and relatively little computing, and the latter using the central computer intensely but little input/output."

It appears that parallel processing in the future will have the facility of being automatically interrupted, automatically returning to the proper place and to jump to a higher priority routine without programer action. Other problems which raise difficulties, however, are: allocation of storage (a master program called the Director has been devised), costing of individual jobs, and the complexity of finding an error in one of several simultaneously running programs.

GOOD TIMES ON COMPUTERS

J. M. Thornley, Urwick Diebold Ltd., England
AUTOMATIC DATA PROCESSING, September 1960; pages 26-28

"The correct approach to timing estimates is to make an estimate for each computer run required; this can be done without having designed a detailed system, although it must be based on a thorough analysis of work to be done, the volumes involved, and a rough plan of the system. The steps involved in a good timing estimate are as follows:

A check-list for timing operations

1. Calculate the maximum input rate.

2. Check that this rate can actually be obtained in view of the size of the file against which it is to be processed, and modify the input rate as required.

3. Check that this modified input rate is reasonable in relation to the calculations to be performed.

4. Determine if any calculation time can be overlapped with file search times.

5. Determine if any calculation time can be overlapped with feed time.

6. Determine if any calculation time can be overlapped with output time.

7. Check the frequency of the various input and file transactions.

8. Work out the time required for each run on the basis of maximum figures."

These are the operations which are important in computer timing:

1. Timing of Input-Output
   - Input-Output Card Handling Time
   - Program Loading Time
   - Input-Output Editing Time

2. Timing of Processing
   - Iteration Control Time (time to set up loops)
   - Programmed Arithmetic Checks
   - High Speed Memory Usage

3. Timing of Magnetic Tape Operations
   - Tape Handling Time
   - Magnetic Tape Start-Stop Time
   - Tape Rewind Times
   - Tape Sorting Time for Multi-Tape Files

4. Timing of Random Access Memories
   - Address Calculation Time for Random Access Stores
   - Random Memory Searching Time
   - Random Memory Overflow Searching

5. Timing of Operations
   - Volume Assumptions
   - Inquiry Times

DIGITAL CODE COMPRESSES INFORMATION TO SPEED DATA COMMUNICATION

IBM DATA PROCESSOR, August-September 1960

IBM's Logical Systems Standards group has devised a digital shorthand" using digital representation or symbols for entire words or common phrases, rather than character-by-character representation. The code can compress language and, to a lesser degree, numbers, so that fewer signals are needed to convey a message. Binary numbers are assigned on the basis of usage frequency. Estimated savings in message lengths is about 60 percent. The digital shorthand can be used over existing transmission equipment. At the sending point a computer-encoder would compress the message by translating words into numbers. At the receiving end a companion unit would convert the numbers back into words. The new code is programed for use on the IBM 7090.

Systems Design

A SIMPLIFIED APPROACH TO BUSINESS PROBLEM ANALYSIS AND PROGRAMING

J. S. Seely, Southern Railway System, Washington, D.C.
Paper presented to ACM Conference, 1960

The development of programing systems lags behind the development of computing devices, and, in the opinion of the author, no industry-wide committee can devise standard programing systems which will adequately solve the specific problems of individual organizations. Each user should consider developing his own programing language, and, indeed, such an effort can result in tremendous savings in time and greater efficiency in future program preparation and revision.

The Operating Department of the Southern Railway System "developed a set of 15 multi-operand instructions, consisting of 15 operations using meaningful English verbs. A simplified means of defining records areas, including fields within these areas, was developed. A provision for the inclusion of descriptive narrative at any point in the program, and of any length, was also a part of the total concept. To develop language acceptable to the assembly program, a converter was programmed that translated instructions in this new language into series of symbolic machine instructions, and in the proper card image format for introduction into the manufacturer's assembly system....A listing in the form of our new system's instructions was also produced by the converter. Clerical errors and certain logical errors were detected and printed below the program listing, with the necessary information for quickly locating them in the main body of the program."

From system listing to machine instruction in one step

Later, the department found they could save much time by converting their language directly to machine instructions, and by not listing the memory locations. They would rely solely upon their system listings, "to the total exclusion of all other permanent documentation, including flow charts. Once the decisions were made, the entire system was programmed, tested, and in operation within two weeks." Most of their programs are assembled in less than a minute, and none has taken as much as two minutes. There are no patched programs. When changes or corrections are needed, the program is reassembled, and even minor refinements are made immediately.

Moreover, use of this system has cut down the training requirements for the programing staff. New people can be trained and on the job in a month, and be more productive than a person with a year's training in a conventional programing system. Washington headquarters systems personnel have seldom had to test out their

programs at the Atlanta computing center, and most corrections to a program are made by mail or telephone. Testing time has been decreased by more than ninety percent.

One of the most important advantages is that the company is not tied to any one manufacturer's equipment, or "to the whims of all other computer users." A computer was recently ordered strictly on its technical merits, without regard to training or reprograming difficulties.

Industry-wide standardization is a dangerous goal

The author believes that "standardization of programing for all machines and for all users is a dangerous thing. There is no assurance that each development or improvement in computer hardware can be utilized within [the standardized program's] parameters. Business problems, unlike scientific programs, are seldom applicable to other installations."

He urges others to develop their own systems and to "accept full responsibility for the entire operation of your installation, and you will find that the freedom you have gained will more than compensate for the loss of collective security acquired by depending upon outside sources for assistance in running your business."

MECHANIZATION OF PERT SYSTEM PROVIDES SP TIMELY INFORMATION

Ralph A. Niemann and Robert N. Learn, Naval Weapons Lab, Dahlgren, Va.
NAVY MANAGEMENT REVIEW, August 1960; pages 10-12

PERT is a management tool used with the NORC in the control of special development projects, such as the Polaris project. Its features are:

1. Specific events which must occur before reaching the final objective are selected.

2. The sequence of events and their interrelationships are determined and shown graphically.

3. Elapsed time estimates are obtained from technical personnel for all the activities linking events.

4. A measure of the uncertainty associated with the accomplishment of events is determined statistically.

5. The information processing and calculations required are performed on the Naval Ordnance Research Calculator (NORC).

Control in the face of uncertainty

For example, in a network linking four events, the events are distinguishable points in time and mark the end of one task and the beginning of another. The tasks linking the events are called the activities. The activity connecting any two events must be completed before the next activity can start. Associated with each activity are three estimates of the time needed to perform the activity: optimistic, pessimistic, and most likely. From these estimates, an "expected time" is computed for each activity by a standard statistical procedure. By using the values of expected time for activities, two figures are computed for each event.

The first is the Earliest Time (E. T.). The E. T. of event two is found by adding the expected time for activity 1, 2 to the E. T. of event 1. In the example given, event 4 is completed only when 2, 4 and 3, 4 are completed, the E. T. of event 4 must allow for completion of the longer of the two paths. A Latest Allowable Time (L. T.) is computed for each event, so that slacks may be determined at intermediate events, where they exist. The procedure is to set the L. T. of the end event at some value, and work backwards through the network. Slack is computed by subtracting the E. T. from the L. T. Events with a zero slack are called critical events. The final step of the procedure is the computation of the probability of meeting a planned schedule date.

PERT has many advantages for management. It gives the manager timely information for better planning and decision making. Hypothetical data can be fed into the computer and many alternative courses of action can be computed, evaluated, and analyzed before a specific decision is made. The generality of its concept makes it applicable as a management tool in many large systems. And it may be used for computing the effect of a specific decision on a particular sub-system as well as the impact of the decision on the overall objective.

Applications

THE CONSOLIDATED FUNCTIONS APPROACH

MANAGEMENT AND BUSINESS AUTOMATION, September 1960; pages 40-47

The Minnesota Mutual Life Insurance Company calls its total systems design for EDP the Consolidated Functions Approach. Their goal was reached in one big step, rather than in many smaller steps. In selecting a computer, they developed a set of standards to measure the various computer systems, based on their desired system, then tried to take advantage of the characteristics peculiar to the selected computer system (a Burroughs 205). These standards included:

1. Balance between memory capacity, computing ability, and input-output.

2. Computation speed adequate to allow completion of the primary application in the allotted time.

3. Purchase price which would produce maximum long-term savings.

4. Compatibility with the Minnesota Mutual Life punched card installation.

5. Reliability from operational and service standpoints.

6. Availability.

One-pass operation and fast inquiry provisions

A major portion of the company's operations are processed in one pass. These include premium billing and accounting, commission calculating and maintenance of loan status, calculation and billing of loan interest, current year dividends, dividend account credits, and paid-up insurance purchased by dividends.

Policy status information is maintained on a Datafile on-line tape storage unit. Requests by letter or phone are keypunched and processed twice daily. The master record for all policies is maintained on 40 reels of tape, with the 600-digit records in order by due day, collection office and policy number. Updating of the master tape is done monthly, 20 days prior to the premium due date. Notices are printed on-line through the Cardatron card-handling system from fixed-format information kept in the printer's storage units.

Rate Book Program computation is also handled by the computer system. The off-line listing of rates becomes a master sheet which is photographed and reduced for offset printing of the rate book. Extra copies of the sheets are made for insertion into appropriate policies.

This and other "secondary" applications are the result of decentralized programing, based on the ability of 27 people throughout the company to program. Any one of these people can be called in for a one-shot job.

Points of Interest

Nationwide Mutual Insurance Company of Columbus, Ohio, will install a National 304 solid-state system next January.

The Office Equipment Manufacturers Institute, under the procedures of the American Standards Association, will carry on a broad program of international standardization of data processing. The program will result in logical systems standards, including a common language.

Telex I and Telex II Disc Files have been developed by Telex, Inc. of St. Paul, Minnesota. Telex II has a capacity of nearly 100 million characters and an average access time of 150 milliseconds.

C-E-I-R, Inc. will install an IBM STRETCH data processing system in its Los Angeles computing center in 1962.

The General Electric Company's Computer Department will open eleven new data processing centers during the next two years in Chicago, New York, Philadelphia, Boston, Cleveland, Minneapolis, Seattle, Atlanta, Washington, Dallas and San Francisco.

System Development Corporation of Santa Monica, California, has purchased a Philco 2000 computer system to be used in SDC's new Systems Simulation Research Laboratory.

The Optical Scanning Punch, developed by Remington Rand Univac, is designed to read handwritten markings on a standard 90-column tab card and punch the appropriate code holes into the same card at the rate of 150 cards per minute.

Daystrom, Inc. of La Jolla, California, can now service computer control and logging equipment quickly via telephone wire through a special console that contains all of the functions of Daystrom installations. (BUSINESS WEEK, September 24, 1960)

Comment

HOW TO EVALUATE HOME STUDY COURSES IN EDP

Persons who want to enter the programing profession and companies that want to train their employees for their new EDP systems have found the education field somewhat barren. Except for scattered university courses buried, generally, in the Business Administration schools, and a few good independent courses taught sporadically by consultants, there has been little available. Individuals and companies alike have been at the mercy of those teaching the courses as far as convenience of location and time are concerned. Employees can hardly be expected to enroll in a full college course to prepare for the eventuality of their company's conversion to EDP. And those living in suburban or rural areas, to which so many large companies have fled, have little access to university classes.

Home study in the plant

Companies, too, have found the training of their employees for an understanding of their own installations a task greatly handicapped by the lack of training facilities in or reasonably near their plant. While computer manufacturers provide in-plant training for companies installing their particular equipment, these courses come at a comparatively late date, and are geared toward the actual operators and programers who will be working in the installation. What many companies would like to have is a general training course for the instruction of broad classifications of their employees in the basic ideas of EDP, during the early stages of planning.

One answer to both these problems is Home Study Courses. Such courses have been used advantageously both by individuals and by companies who wish to train their employees. Individuals enroll in home study courses for any of several reasons. Some take a course to get the jump on other employees in their company when a tentative announcement is made of the installation of EDP equipment. CPA's Take courses because they feel they must know something about EDP in order to better serve their clients. Methods people take home study courses to get a picture of the problems involved in designing an EDP system.

Home study is a convenient way for an individual to get training in EDP. He can study on his own time, and progress at his own rate, and the fact that he has taken the trouble to pursue such study may be much to his advantage. For example, one man who had completed an EDP home study course obtained consideration for an EDP team in his own company, whereas his age would have automatically eliminated him from consideration. He became a member of a 25-man programing team selected from 75 possibilities.

An increasing number of large companies which expect to install EDP systems are turning to home study courses for the systematic training of their employees in an understanding of the new system. Several banks have made use of these courses not only to train programing personnel, but also to train branch people who will feed data to the installations.

Two plans of study

In-company use of home study courses usually follows one of two plans: 1) The text material is sent to the student who in turn submits his assignments to the home study school. The graded material is then returned to the company's course monitor, who distributes it to the student. 2) Text material is sent either to the student or to the monitor as requested. The student returns the problem solutions to the school for grading. Meanwhile, the school has furnished a complete set of all school solutions for each student to the company's monitor. The monitor distributes these after each assignment is sent to the school for grading. This speeds up the study time, because the student can proceed to the next assignment without waiting for solutions to be returned from the school.

How do you select a good one?

How does an individual or a company go about selecting a good, reliable home study course? At present there aren't many, but this situation is bound to change. Some evaluative questions for selecting a good home study course might include:

1. Is the course well planned and are the lessons fully explained?
2. Is each submitted lesson graded and returned promptly?
3. Are mistakes clearly explained?
4. Do the comments on returned material indicate an understanding of the pupil's abilities?
5. Are the courses constantly being improved?
6. Are new courses added to suit new requirements?
7. Is the school willing to refer you to individuals or companies who have taken the course?
8. Does the school provide a fair contract?
9. Does the school avoid gaudy promises of success or a job on completion of the course?
10. Does the school belong to a reliable professional organization of correspondence or home study schools?

If the answer is "yes" to all the above questions, it probably is a good, legitimate home study school. Fortunately, there is a standard by which worthwhile schools may be selected. This is the

Accreditation of the National Home Study Council. The NHSC is an association of private correspondence schools which is pledged to promote sound educational standards and ethical business practices. The Accrediting Commission of the Council has been approved as a nationally recognized accrediting agency by the U. S. Office of Education. It has top educators on its staff, and spends from six months to two years examining petitioning home study schools before approving them for accreditation. Information about a home study school may be obtained from the National Home Study Council, 2000 K St., N. W., Washington 6, D. C.

A new angle

A recent interesting development in home study has nothing to do with a correspondence school. We refer to the automatic teaching device known as TutorTexts (DPD October 1960, page 1).

As more textbooks of this kind are written and published, it will become increasingly convenient for companies to prepare their personnel with a basic understanding of the EDP installation before they dig into the study of operating procedures.

Training

"New Concepts in Planning and Installing EDP" Course #30 presented by Richard G. Canning, Consultant

Date: December 5-9, 1960
Place: New York City (Hotel Biltmore)
Fee: $250
Information: Richard G. Canning, 614 S. Santa Fe Ave., Vista, California

Engineering and Management Course, presented by University of California at Los Angeles

Date: January 23--February 2, 1961
Place: UCLA Campus
Fee: $450
Information: Reno R. Cole, Coordinator, The Engineering and Management Course, College of Engineering, University of California, Los Angeles 24, California

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References

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